Letter of Transmittal

Penn E&R
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Date: October 25, 2004 **Project No.:** 4000-PA4072-02

To: Mr. John T. Buckley
U.S. Nuclear Regulatory Commission
TWFN, 7F27
Washington, DC 20555

Re: Kaiser Tulsa Site
Thorium Remediation Project

We are sending you the following item(s):

Quantity	Date	No.	Description
1	October, 2004		Penn E & R SMCM QA Plan, Revision 2

These are transmitted as checked below:

☐ For your use ☒ Enclosed
☐ As Requested ☐ Under Separate Cover via: _____
☐ Return of requested material
☒ Other: For your information.

Remarks: On behalf of Kaiser Aluminum & Chemical Corporation, the above referenced plan is transmitted for your information.

Copy to: Distribution (see attached) **Signed:** [signature]

If enclosures are not as noted, please notify our office immediately.

NMSS01

Kaiser Plan and Procedure Distribution

Mr. John T. Buckley US Nuclear Regulatory Commission TWFN, 7F27 Washington, DC 20555 ***FedEx***	Mr. S Paul Handa Kaiser Aluminum & Chemical Corporation 7311 East 41st Street Tulsa, OK 74145 ***(Three copies in one FedEx envelope)***
US Nuclear Regulatory Commission Document Control Desk Washington, DC 20555-0001 ***FedEx***	Diana Brown RECON 7311 East 41st Street Tulsa, OK 74145 ***FedEx***
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SMCM Landfill Mode Performance Verification QA Plan

REVISION: 00

EFFECTIVE DATE: October 2004

Approved by: J. W. (Bill) Vinzant – Project Manager

10-20-04
Date:

SMCM Landfill Mode Performance Verification QA Plan

REVISION: 00

EFFECTIVE DATE: October 2004

Prepared by: Date: 10/19/04
Andrew J. Lombardo
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Approved by: Date: 10/19/04
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Title: **SMCM Landfill Mode Performance Verification Plan**

PURPOSE

To define Quality Assurance (QA) measures needed to verify performance of the onsite SMCM counting system operated in the landfill mode.

1.0 DEFINITIONS

SMCM: Subsurface Multi-channel Contamination Monitor

2.0 BACKGROUND INFORMATION

The SMCM counting system consists of gamma spectroscopy measurements taken every one second as material passes beneath the detector via a conveyor system. This material is stockpiled in approximate 100 ton piles numbered L-0001 through L-00XX. The counting statistics for all of the 1 second acquisitions including mean, median, minimum, maximum and standard deviation of the Th-232 activity concentration in units of picoCuries per gram (pCi/g) are produced for each stockpile. The system is operated by RECON onsite. RECON will perform verification sampling of the stockpiles for analysis by Outreach Labs, an offsite radio-analysis facility, as defined in the RECON Verification Sampling – Landfill Piles Memorandum dated October 7, 2004.

The Recon sampling consists of 9 equal distant samples taken from each stockpile and composited prior to sending to Outreach for gamma spectroscopy analysis of the Th-232 activity concentration. Note, a standard 2,000 m^2 survey unit (of assumed 6-inch depth and standard soil density of 1.4 g/cc) equals 470 tons of material and requires 9 equal distant samples to accurately represent the average activity concentration (MARSSIM, Kaiser FSSP and DP). The minimum number of 9 samples is contingent on the ability to identify elevated areas with a survey meter, in other words on the uniformity of the survey unit as verified by walk over survey. Nine samples of 100 ton (or even 200 or 300 ton) stockpiles exceeds the number required when combined with measurements and/or observations of the uniformity of the stockpiled material.

3.0 PLAN

Penn E&R will support and augment the RECON verification sampling of the stockpiles as follows, recording all observations and measurements:

3.1. Review the stockpile SMCM statistics prior to survey and sampling of the pile. Note the variability of the material segregated to make up the pile.

3.2. Perform a visual survey of the stockpile. Note the physical consistency and moisture of the material.

3.3. Perform an exposure rate or gross gamma survey of the stockpile to identify any obvious elevated areas within the pile. The segregation of the material making up the stockpile and the transport to the stockpile area should mix the stockpile material. Sample elevated areas for onsite Penn E&R cave count as necessary.

3.4. Assist with (verify) the 9 equal-distant samples taken by RECON to make up the composite sample of the stockpile, including the standard sample of each of the 9 locations for screening in the onsite Penn cave counter, prior to compositing.

3.5. Assist with (verify) a standard sample of the composite of the 9 samples is taken for onsite Penn cave counting.

3.6. Count each of the samples in the onsite Penn E&R cave and covert the results to Th-232 activity concentration. (The onsite cave uses a 125 cpm / pCi/g calibration factor to

convert average (of the top and bottom counts) net count rate to pCi/g of Th-232. The conversion factor is the average of 19 soil samples ranging from 7.6 to 560 pCi/g (910 to 83,220 ncpm respectively).

3.7. Calculate the mean, median, minimum, maximum and standard deviation of the Th-232 activity concentration results.

3.8. Compare the results to those of the SMCM. Note that the Penn E&R Cave has a 10% positive bias relative to Outreach.

In addition, Penn E&R may perform any of the following additional functions to ensure the quality of the SMCM output:

3.9. Take additional samples (beyond the 9) based on a review of the stockpile variability and/or identified elevated areas.

3.10. When the frequency of stockpile frequency is decreased, e.g., 1 of 10 or 1of 20, intermittently sample additional stockpiles using the same protocol established in the Recon memo and this plan.